FOMENKO, I.G. (Vinnitsa)

Experience in teaching machanical engineering in pedagogical institutes. Politekh.obuch. no.6:77-81 Je '59.
(MIRA 12:12)
(Technical education) (Vinnitsa--Teachers, Training of)

FOMENKO, I. M., OPPENGEYM, I. V.

Khar'kov

"Compensation for Carriage Setting During Shaping of Lathe Bedways" Stanki i Instrument, 12, No. 1, 1941.

[redacted] Report U-1503, 4 Oct. 1951

WE FOMENKO, I.M.

Materials Subdivision
Technique

538.221.029.5:6 3468

The Magnetic Spectra of the Ni-Zn Ferrites at Radio Frequencies. - I. ... Fomenko. (*Zh. eksp. teor. Fiz.*, Nov 1951, Vol 21, No 11, pp 1201-1208) The influence of frequency on the elastic and viscous permeabilities of ferrites is considered. The Ni-Zn ferrites have a continuous magnetic spectrum with sharply defined dispersion bands of elastic permeability and absorption bands of viscous permeability at frequencies from 0.75 to 360 Mc/s

FOMENKO, I.M.

Reduce the volume of sugar beets transported by rail. Sakh. prom. 31 no.6:42-47 Je '57. (MIRA 10:6)

1. Gosplan SSSR.
(Sugar beets--Transportation)

FOMENKO, I.M.

FOMENKO, I.M.

Surmount shortcomings in harvesting and procurement of sugar beets in the Baltic Sea region. Sakh.prom.31 no.9:1-4 S '57. (MIRA 10:12)

1. Gosplan SSSR.
(Baltic States--Sugar beets--Harvesting)

FOMENKO, I.M.

Planning and improving the utilization of productive capacity.
Sakh. prom. 32 no. 7:43-50 Jy '58. (MIRA 11:8)

1. Gosplan SSSR.
(Sugar industry)

FOMENKO, I.M.

Sugar industry in the first half of 1959. Sakh. prom. 33 no.5:5 My '59. (MIRA 12:7)

(Sugar industry)

FOMENKO, I.M.

Some results of the 1958/1959 production season. Sakh.prom. 33 no.7:1-3 Jl '59. (MIRA 12:11)
(Sugar industry)

FOMENKO, I.M.

Improve production operations in sugar factories. Sakh. prom. 33 no.10:1-3 O '59. (MIRA 13:3)

1. Gosplan SSSR.
(Sugar industry)

FOMENKO, I.

Brief information. Sakh.prom. 33 no.10:31 O '59.
(MIRA 13:3)

(Sugar industry)

FOMENKO, I.M.

Kirghizistan sugar beets. Sakh.prom. 33 no.12:34 D '59.
(MIRA 13:4)

(Kirghizistan--sugar beets)

FOMENKO, I.M.

Fulfilling the plan for building and reconstructing sugar factories in 1960. Sakh.prom. 34 no.5:1-3 My '60. (MIRA 14:5)

1. Gosplan SSSR.
(Sugar industry)

FOMENKO, I.M.

More effective processing of sugar beets of the 1961 crop. Sakh. prom. 35 no.11:1-4 N '61. (MIRA 15:1)
(Sugar beets) (Sugar manufacture)

DUBOVOY, A.B.; FOMENKO, I.P., red.; BABIKOV, V.P., tekhn.red.

[Participation of Soviet trade unions in economic development] Uchastie sovetskikh profsoiuzov v khoziaistvennom stroitel'stve. Moskva, Profizdat, 1962. 143 p. (MIRA 16:4)
(Trade unions) (Industrial management)

TIMOFEYEV , T., otv. red.; MAYDANIK, K., red.; PESCHANSKIY, V., red.; FOMENKO, I.P., red.; MESHALKIN, V.I., tekhn. red.

[Class struggles are shaking the capitalist world; A new surge of the revolutionary worker's movement]Klassovye bitvy sotriasaiut mir kapitala, novyi pod"em reboliutsionnogo rabochego dvizheniia. Moskva, Profizdat, 1962. 334 p. (MIRA 16:3)

(Labor and laboring classes)

FITISOV, Vasiliy Anisimovich; FOMENKO, I.P., red.; ANDREYEVA, L.S., tekhn. red.

[Organization of workers' rest] Organizatsiia otdykha trudiashchikhsia. Moskva, Profizdat, 1963. 45 p. (Biblioteckha profsoiuznogo aktivista, no.23(71)) (MIRA 17:3)

BAYBARIN, Petr Pavlovich; PUTYAYEV, Sergey Aleksandrovich; FOMENKO, I.P., red.; ZAYTSEVA, L.A., tekhn. red.

[Industrial safety committee of the factory and plant local committee] Komissiia FZMK po okhrane truda. Moskva, Profizdat. 1963. 61 p. (Bibliotechka profsoiuznogo aktivista, no.12(60)) (MIRA 16:12)
(Trade unions) (Industrial safety)

CHERKASOV, Geliy Nikolayevich; FOMENKO, I.P., red.

[For the trade-union activist group on the scientific organization of work] Profsoiuznomu aktivu o nauchnoi organizatsii truda. Moskva, VTsSPS Profizdat, 1965. 94 p. (Bibliotechka profsoiuznogo aktivista, no.2(98))
(MIRA 18:4)

CHUDAKOV, Arkadiy Il'ich; FOMENKO, I.P., red.

[Local trade-union committee of a commercial enterprise] Mestkom profsoiuza torgovogo predpriiatiia. Moskva, Profizdat, 1965. 77 p. (MIRA 18:10)

FOMENKO, I.R.

Basic results of and trends in oil and gas prospecting in Stalingrad Province. Trudy VNIGNI no.28:24-32 '60. (MIRA 14:4)

1. Upravleniye neftyanoy i gazovoy promyshlennosti Stalingradskogo sovnarkhoza.
(Stalingrad Province—Petroleum geology)
(Stalingrad Province—Gas, Natural—Geology)

FOMENKO, I.S.

USSR/ Miscellaneous

Card 1/1 Pub. 133 - 12/19

Authors : Fomenko, I. S., Chairman, Chernigov oblast Committee of the Union of Professional Communication Workers

Title : Practice in controlling socialistic competitions

Periodical : Vest. svyazi 4 (181), 23-24, Apr 1955

Abstract : A description is presented of a practical method of controlling the socialistic competition widely practiced by the workers of communications in the Chernigov oblast.

Institution : .....

Submitted : .....

S/276/63/000/002/046/052
A052/A126

AUTHOR: Fomenko, I.V.

TITLE: Glass as a lubricant in hot deformation of metals and alloys

PERIODICAL: Referativnyy zhurnal, Tekhnologiya mashinostroyeniya, no. 2, 1963, 47, abstract 2V274 (Steklo. Byul. Gos. n.-i. in-ta stekla, no.2,(115), 1962, 48-53)

TEXT: At the Nikopol' Yuzhnotrubnyy plant a horizontal hydraulic press department is being put into service; the department will use glass lubricant developed by the Institute of Glass. A similar department will be put into service in the Urals in 1963. The following conditions must be met by glass lubricants: 1) a certain set viscosity in the narrow temperature range of hot pressing; 2) no chemical reaction with the workpiece and tool material; 3) glass remainders must be easily removed after pressing. For Cr and Ni-base alloyed steels glass lubricants containing 15-20% boron oxide and 4-12% alkali oxides are suitable. Various types of lubricants have been developed. Hydrosuspension lubricants are used at flame heating i.e. in an oxidizing atmosphere of high-alloy steels and alloys.

Card 1/2

S/276/63/000/002/046/052
A052/A126

Glass as a lubricant...

Powdered lubricants and lubricants of unwoven roll glass fiber material HCPMC (NSRMS) are used at unoxidizing induction heating of blanks of low- and high-alloy steel grades. Remainders of glass lubricants can be removed from pipes by etching and also mechanically when straightening the pipes. Lubricants for pressing pieces of ЭИ-437 (EI-437), Б(B), ЭИ-867 (EI-867), ЭИ-598 (EI-598) alloys and 1 Х18 Н9Т (1Kh18N9T), ЭИ-943 (EI-943), and ЭИ-726 (EI-726) steels have been composed. There are 4 figures.

I. Gendlina

(Abstracter's note: Complete translation.)

Card 2/2

L 10712-63 EPR/EPF(c)/EWP(q)/EWT(m)/BDS--AFFTC/ASD/ESD-3/AFGC--
Ps-4/Pr-4/Pq-4--EW/WW/WH/DJ
ACCESSION NR: AP3001651 S/0063/63/008/003/0356/0356

80
78

AUTHOR: Matveyev, M. A.; Fomenko, I. V.

TITLE: The use of glass lubricants in the production of metallic tubing

SOURCE: Vsesoyuznoye khimicheskoye obshchestvo. Zhurnal, v. 8, no. 3, 1963, 356

TOPIC TAGS: lubricant, hot deformation of steel, boron glasses, powdered glass, 1 Kh 18 N 9 T stainless steel, metallic tubing, hot deformation of steel

ABSTRACT: The requirements of a lubricant, including a glass lubricant, usable in hot deformation of steel are: non-reactivity with formed metal or with equipment; removability of lubricant after working; and the determination of prescribed viscosity in the narrow temperature interval used in hot-forming. Glasses containing 18-20% boron and about 12% alkali oxides are not reactive with the metals, have a coefficient of expansion that permits their self removal or easy removal from the tubing formed, and have the required viscosity at working temperatures. The use of powdered glass did not provide satisfactory lubrication in the tubular extrusion of 1 Kh 18 N 9T stainless steel. A suspension of glass (in liquid glass of higher modulus and 6-12% water) on the cold billet, or use of glass fiber or

Card 1/2

L 10712-63
ACCESSION NR: AP3001651

2

glass wool discs, gave on heating a continuous protective coating, improving surface of the tubing and increasing durability of the press by a factor of 20. Orig. art. has: 1 figure.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Moscow Chemical-Technological Institute)

SUBMITTED: 06Aug62 DATE ACQ: 01Jul63 ENCL: 00

SUB CODE: OO NO REF SOV: 000 OTHER: 000

bm/c.l.
Card 2/2

S/169/61/000/011/021/065
D228/D304

AUTHOR: Fomenko, K.Ye.

TITLE: Deep seismic zoning in south-eastern Turkmeniya

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 11, 1961, 23, abstract 11A204 (Izv. AN TurkmSSR, Ser. fiz.-tekhn., khim. i geol. n., no. 4, 1960, 71 - 74)

TEXT: The results of investigations are briefly examined. Refracted waves with a velocity of 4 - 5 km/sec., corresponding to a Meso-Cenozoic complex with a thickness of about 4 - 5 km, were observed in the interval 0 - 15 km. Then, within 15 - 23 km from the explosion point, a group of waves with a velocity of 6.0 - 6.2 km/sec. was established. A branch with a velocity of 6.7 - 6.8 km/sec. was observed at a distance of 40 - 45 km, its corresponding discontinuity surface lying at a depth of 9 - 11 km. This boundary is the Palaeozoic or Pre-Cambrian basement. Several wave groups, corresponding to refractive boundaries in the crust's lower part with velocities of 7.0 - 7.3, 7.5 - 7.7, and 8.0 - 9.5 km/sec., were distin-

Card 1/2

S/169/61/000/011/021/065
D228/D304

Deep seismic zoning in ...

guished at distances in excess of 50 km. These latter are related to the Mohorovicic surface and deeper boundaries. Waves reflected from the Mohorovicic surface were also observed. Waves refracted at this surface emerge as first arrivals at a distance of about 160 km from the explosion site and rapidly die out with distance. The general configuration of the Mohorovicic surface is distinguished by its non-conformity with the overlying horizons; it sinks in the profile's eastern part against the general background of the rise of the upper layers. This explains the decrease in the absolute values of the gravity anomalies (Δg) towards the east. The general sinking of all deep horizons in the west, to the side of the Kopet-Dag, explains the presence of large negative Δg-anomalies. The general form of the regional gravity and magnetic fields is also explained by the structural peculiarities of the abyssal boundaries, while the local anomalies are related to complications within the Meso-Cenozoic complex. [Abstractor's note: Complete translation].

Card 2/2

FOMENKO, K. YE.

Cand Geol-Min Sci, Diss -- "Regional seismic investigations by the KMPB-GSZ /Korelyatsionnyy method prelomlennykh voln - Glubinnoye seysmicheskoye zondirovaniye -- Correlation method of refraction waves - Deep seismic sounding/ in a study of the deep geological structure of southeastern Turkmen". Moscow, 1961. 21 pp, 20 cm (Min of Geol and Ore Conservation of the USSR. All-Union Scientific-Res Geol-Prosp Petro Inst "VNIGNI"), 200 copies, Not for sale, 10 works by author listed on p 21 (KL, No 9, 1961, p 178, No 24295). /61-558987

FOMENKO, K.Ya.

Some results of interpreting the materials of transverse profiling by hodographic-seismic sounding in southeastern Turkmenistan. Izv. AN Turk. SSR. Ser. fiz.-tekh., khim. i geol. nauk no.4: 126-129 '61. (MIRA 14:12)

1. Otdel razvedochnoy geofiziki i seysmologii AN Turkmenskoy SSR.

(Turkmenistan--Geology)

MASHRYKOV, K.K.; FOMENKO, K.Ye.

Recent data on the deep geological structure of southeastern Turkmenistan. Izv. AN Turk. SSR. Ser. fiz.-tekh., khim. i geol. nauk no.6:46-53 '61. (MIRA 15:3)

1. Otdel razvedochnoy geofiziki i seysmologii AN Turkmenskoy SSR.

(Turkmenistan--Geology, Structural)

GODIN, Yu.N.; VOL'VOVSKIY, B.S.; VOL'VOVSKIY, I.S.; FOMENKO, K.Ye.

Studying the structure of the earth's crust in the course of regional seismic explorations on the Russian Platform and in Central Asia; materials presented at the 12th General Assembly of the International Union of Geodesy and Geophysics. Izv. AN SSSR. Ser. geofiz. no.10:1464-1471 O '61. (MIRA 14:9)

1. AN Turkmenskoy SSR i Vsesoyuznyy nauchno-issledovatel'skiy institut geofizicheskikh metodov razvedki.
(Seismometry) (Earth--Surface)

FOMENKO, K.Ye.

Problem of estimating the correctness of the construction of cross sections by deep seismic sounding and the correlation method of refraction waves (southeastern Turkmenistan). Izv.AN Turk.SSR.Ser.-fiz.-tekh.,khim.i geol.nauk no.3:32-35 '62. (MIRA 16:5)

1. Otdel razvedochnoy geofiziki i seysmologii AN Turkmenskoy SSR.
(Turkmenistan--Seismic prospecting)

AVROV, P.Ya.; BULEKBAYEV, Z.Ye.; GARETSKIY, R.G.; DAL'YAN, I.B.; ZHURAVLEV, V.S.; MULDAKULOV, G.G.; FOMENKO, K.Ye.; SHLEZINGER, A.Ye.

Basic characteristics of the structure of the eastern and southeastern margins of the Caspian Lowland based on subsalt sediments. Geotektonika no.1:118-125 Ja-F '65. (MIRA 18:5)

1. Institut geologicheskikh nauk imeni Satpayeva AN Kazakhskoy SSR i Geologicheskiy institut AN SSSR.

GORDON, L.V.; UVAROV, I.P.; KATUNIN, V.Kh.; SHUTOV, A.F.; KAMINER, B.B.; FOMENKO, L.A.

Distillation and coking of wood tars with a solid heat carrier. Gidrolis.i lesokhim.prom. 13 no.3:3-4 '60. (MIRA 13:7)

1. Tsentral'nyy nauchno-issledovatel'skiy lesokhimicheskiy institut (for Katunin). 2. Gosudarstvennyy nauchno-tekhnicheskiy komitet Soveta ministrov RSFSR (for Shutov). 3. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza (for Fomenko).
(Wood tar) (Distillation)

FOMENKO, L. A.

USSR/Electronics - Reactors Sep/Oct 49
Permeability

"Frequency Dependence of the Magnetic Permeability of Closed Magnetodielectric Cores Over a Wide Range of Frequencies," L. A. Fomenko, Engr

"Radiotekh" Vol IV, No 5, pp 3-13

Presents basic information necessary for calcg the values of permeability over a wide frequency range for various intensities of a dc magnetizing field. Gives formulas in a form suitable for direct engineering calcns. Gives brief notes on the application of the permeability values in the calcn of

206T52

USSR/Electronics - Reactors (Contd) Sep/Oct 49

inductance, loss resistance, and dissipation factor of reactors with closed magnetodielec cores. Submitted 14 May 49.

206T52

FOMENKO, L. A.

USSR/Physics - Magnetic Spectra — Nov 51

"Magnetic Spectra of NiZn Ferrites in Radio Frequencies," L. A. Fomenko, Cen Lab for Prevention of Industrial Radio Disturbances

"Zhur Eksper i Teoret Fiz" Vol XXI, No 11, pp 1201-1208

Analyzes frequency behavior of elastic and viscous permeabilities of ferrites in radio frequency. Shows that the NiZn samples have a continuous magnetic spectrum with conspicuous dispersion bands of elastic permeability and absorption bands of viscous permeability within a frequency band of 0.75-360 Mc. Character of frequency behavior of

204T89

USSR/Physics - Magnetic Spectra (Contd) — Nov 51

permeabilities may be approximated by relaxation eq from theory of viscosity spectra by Arkad'yev. Acknowledges assistance of Prof V. K. Arkad'yev. Submitted 23 Oct 50.

204T89

FOMENKO, L.

PA 255T86

USSR/Electronics - Interference Filters Mar 53

"Chokes and Capacitors for Protection Against Industrial Interference," S. Averbukh, L. Fomenko, Leningrad, Central Laboratory of Industrial Interference

Radio, No 3, pp 54-57

Discusses protective filter chokes and capacitors and the conditions required for their effective use. Choke cores are usually made of high alloy transformer steel or magnetodielectrics (e.g., alsifer TCh-60). Data for several protective chokes developed by the Central Laboratory for the Prevention of Industrial Radio Interference, Min of Elec Industry, is given in two tables. Also describes capacitors for filters in some detail.

IL'GEKIT, F.E.; SHAPIRO, D.N.; FOMENKO, L.A.; KARPINSKIY, M.A.; FERSMAN, A.A.; PEVNITSKIY, V.P. [reviewers]; LYUTOV, S.A. [author].

"Industrial interference with radio reception and its control." S.A.Liutov. Reviewed by F.E.Il'gekit, D.N.Shapiro, L.A.Fomenko, M.A.Karpinskii, A.A. Fersman, V.P.Pevnitskii. Elektrichestvo no.12:85-87 D '53. (MLRA 6:11)

1. TSentral'naya laboratoriya po bor'be s industrial'nymi radiopomekhami MESEP SSSR (for Il'gekit, Shapiro and Fomenko). 2. Leningradskiy elektrotekhnicheskiy institut (for Karpinskiy). 3. Leningradskoye vysshaye morekhodnoye uchilishche (for Fersman and Pevnitskiy).
(Radio--Interference) (Liutov, S.A.)

USSR

538.221

8419. Effect of the dimensions of a core specimen made from Ni-Zn ferrites on its magnetic spectrum. L. A. Fomenko. Letter in *Zh. eksper. teor. Fiz.*, 24, No. 3, 363–5 (1953) *in Russian.*

See Abstr. 5593 (1952). It has been found that the order of magnitude of the constants of magnetic viscosity for ferrites in the range $5 \times 10^4 - 6 \times 10^7$ c/s is not substantially affected by the size of the core specimen.

F. LACHMAN

FOMENKO, L.A.

Temperature functions of the magnetic spectra of nickel-zinc-ferrites in radio frequency bands. Zhur.eksp. i teor.fiz. 25 no.1:107-114 Je '53. (MLRA 7:10)
(Nickel-zinc-ferrites--Spectra) (Radio waves)

USSR/Electronics - Noise suppressors

FOMENKO, L. A.

Card 1/1 : Pub. 90-6/14

FD-1469

Author : Kazarnovskiy, D. M., and Fomenko, L. A.

Title : Ferroelectric capacitors for noise suppression

Periodical : Radiotekhnika 9, 43-47, Sep/Oct 1954

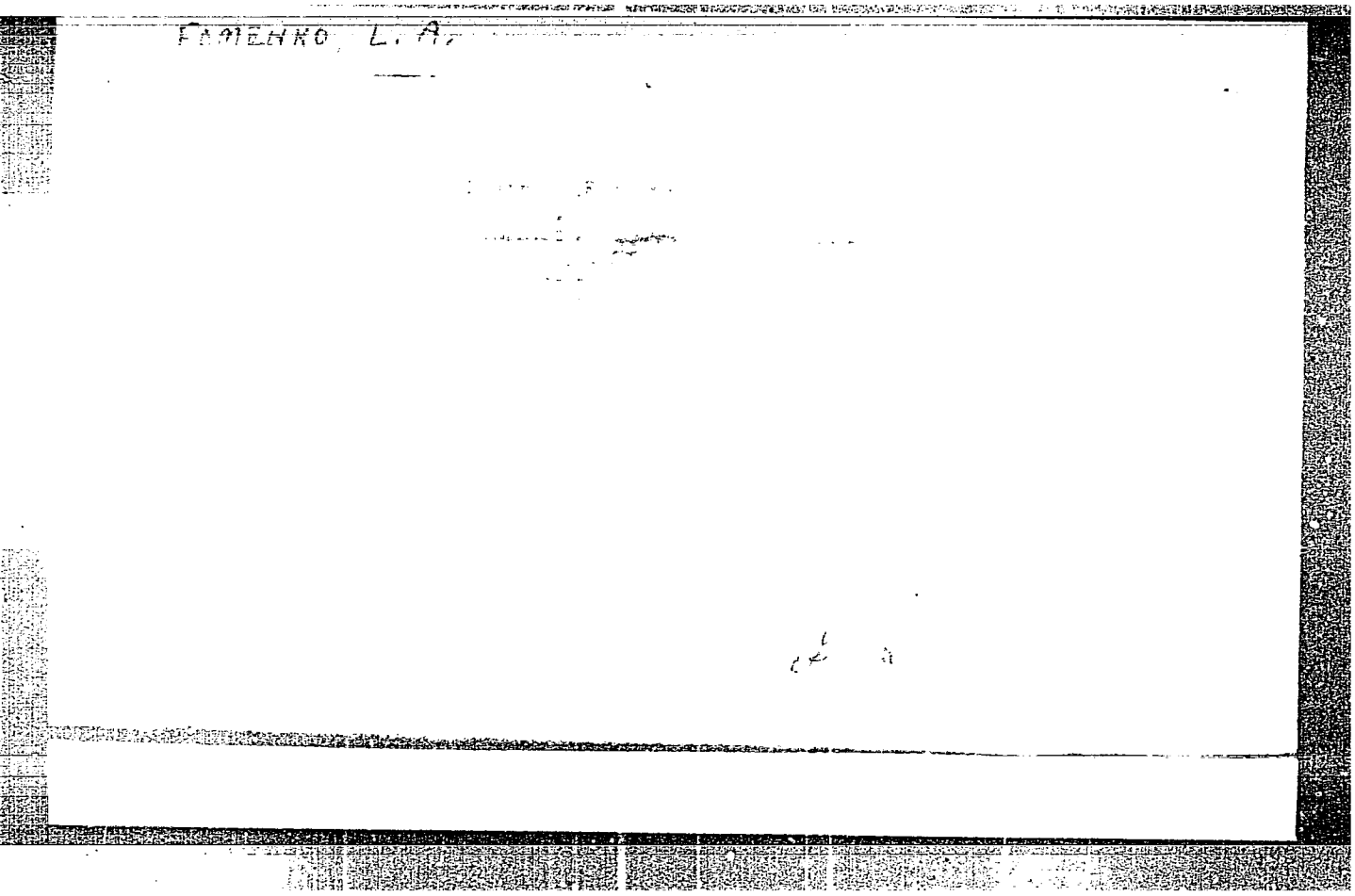
Abstract : The authors describe a ferroelectric by-pass capacitor for suppression of interference to radio reception, citing data from their investigation of it and comparing its performance with that of analogous paper capacitors. Preliminary data indicate that ferroelectric capacitors should cost 30% less to mass produce than paper capacitors. Ferroelectric capacitors for suppression of industrial radio interference are a future prospect depending on the further improvement of radio ceramics. Six references: USSR (1938-1954). Diagrams; graphs; photo.

Institution :

Submitted : February 2, 1954

FOMENKO, L. A., (Leningrad)

"Radio-Frequency magnetic Spectra of Mixed Ferrites," a paper submitted at the International Conference on Physics of Magnetic Phenomena, Sverdlovsk, 23-31 May 56.



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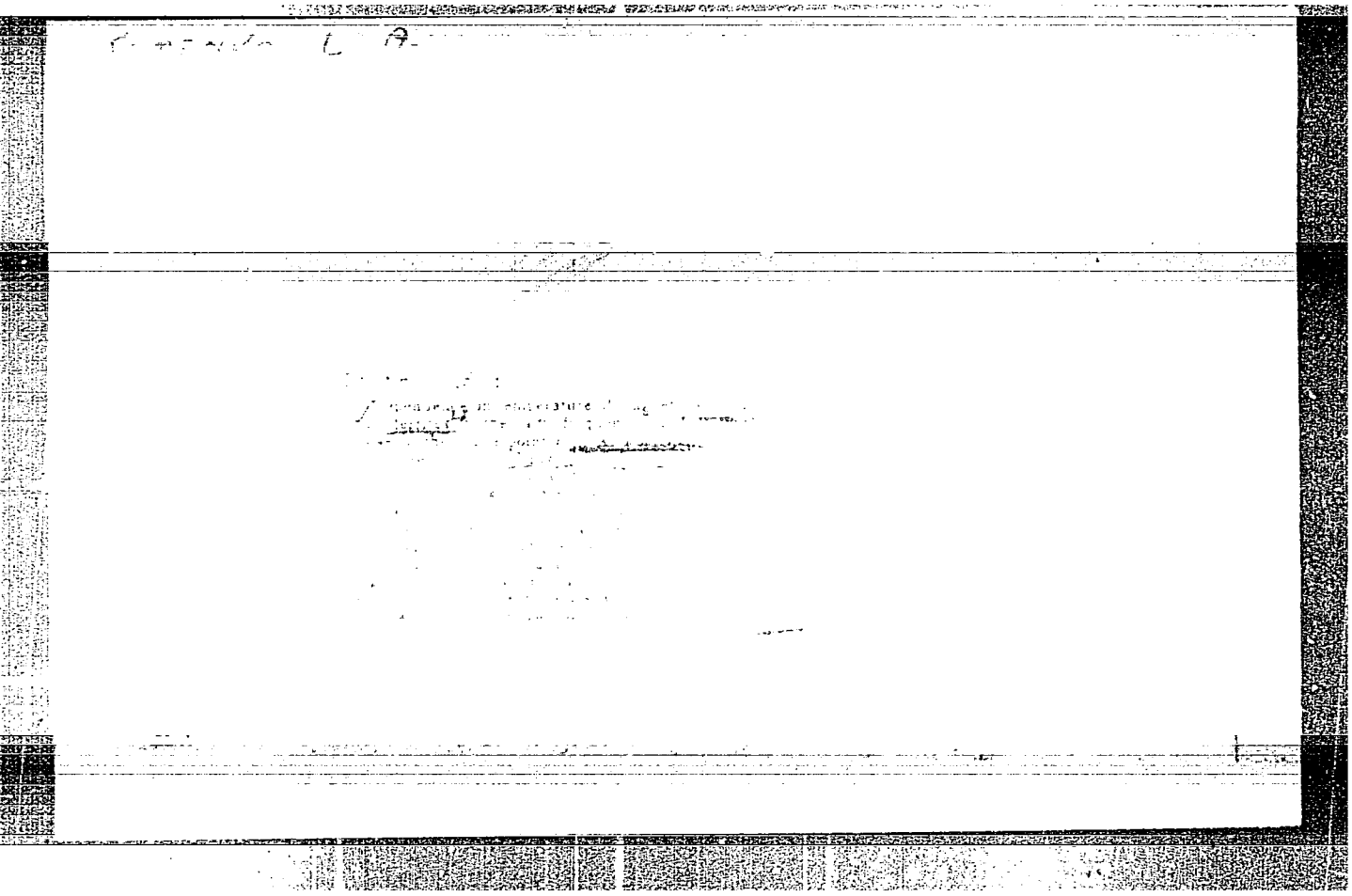

FOMENKO, L.A.

On the mechanism of radio-frequency dispersion in mixed ferrites. Fiz.met.i metalloved. 2 no.1:22-26 '56. (MIRA 9:7)

1.TSentral'naya laboratoriya po bor'be s industrial'nymi radiopomekhami Ministerstva elektrotekhnicheskoy promyshlennosti SSSR.
(Ferrite--Magnetic properties)

Fomenko, L.A.

AUTHOR: Fomenko, L.A.

TITLE: Magnetic Spectra of Solid Solutions of Ni-Zn-Ferrites in Radiofrequency Band at Temperatures close to the Curie Point (Magnitnyye spektry tverdykh rastvorov Ni-Zn-ferritov v diapazone radiochastot pri temperaturakh, blizkikh k tochke Kyuri)

PERIODICAL: Izvestiya Akademii Nauk, Vol. XX, #11, pp 1336-1347 1956, USSR, Seriya fizicheskaya

ABSTRACT: The subject of this article is investigation of temperature dependence of radiofrequency magnetic spectra of ferromagnetic substances at temperatures close to the Curie point, and the checking of a theoretical formula derived by the author in a previous work (3).

A toroidal core of the Ni-Zn-ferrite of the "oksifer -2000-I" type was chosen for investigations. Its initial magnetic permeability was 2,075 gauss/oersted at 20°C and its Curie point was 70°C.

Card 1/4

TITLE: Magnetic Spectra of Solid Solutions of Ni-Zn-Ferrites in Radiofrequency Band at Temperatures close to the Curie Point (Magnitnyye spektry tverdykh rastvorov Ni-Zn-ferritov v diapazone radiochastot pri temperaturakh, blizkikh k tochke Kyuri)

Investigations of magnetic spectra were conducted according to the methods described in previous works (3,15) and consisted of two independent groups of experiments:

1. A study of temperature dependences of the real and imaginary components of magnetic permeability and of tangent of angle of magnetic loss, that is $\mu(t)$, $\rho'(t)$ and $tg\delta(t)$ at various frequencies, and

2. A study of frequency dependences of the curves $\mu(f)$ and $\rho'(f)$ at various temperatures.

The investigation was conducted in the radiofrequency band from 0.2 to 60 megacycles in the range of temperatures from 20 to 160°C.

Card 2/4 The investigation of magnetic spectra has shown that:

TITLE: Magnetic Spectra of Solid Solutions of Ni-Zn-[illegible] rites in Radiofrequency Band at Temperatures close to the Curie Point (Magnitnyye spektry tverdykh rastvorov Ni-Zn-ferritov v diapazone radiochastot pri temperaturakh, blizkikh k tochke Kyuri)

1. Dispersion and absorption bands of magnetic spectra shift at first toward low radiofrequencies and then with the rise of temperature towards high frequencies.

2. A temperature $t \approx 66^{\circ}C \leq \theta$ (Curie point) was discovered, at which the curves $tg\delta$ (t) have maxima for frequencies $f \leq f_u$ (absorption maximum frequency), which do not depend on a frequency at which measurements were carried out, and the high-frequency magnetic viscosity reaches its maximum value. It is suggested that this temperature be called "the point of thermal maximum of radiofrequency magnetic viscosity."

3. The experimental results at low temperatures are described by the inertia of effective mass of the fluctuating border, and those at high temperatures are described by gyromagnetic resonance observed in the "effective magnetic field."

Card 3/4

TITLE: Magnetic Spectra of Solid Solutions of Ni-Zn-Ferrites in Radiofrequency Band at Temperatures close to the Curie Point (Magnitnyye spektry tverdykh rastvorov Ni-Zn-ferritov v diapazone radiochastot pri temperaturakh, blizkikh k tochke Kyuri)

4. A new method of approximate determination of the Curie point is proposed, which makes use of the temperature maximum of the tangent of angle of radiofrequency losses.
The bibliography lists 61 references, of which 19 are Slavic (Russian). The article contains 11 graphs and 1 table.

INSTITUTION: No indication

PRESENTED BY:

SUBMITTED: No date

AVAILABLE: At the Library of Congress

Card 4/4

Fomenko, L.A.

AUTHOR: Fomenko, L.A.

TITLE: Investigation of Magnetic Spectra of Mixed Ferrites in the Residual Magnetization State in the Band of Radio Frequencies (Issledovaniye magnitnykh spektrov smeshannykh ferritov v sostoyanii ostatochnoy namagnichennosti v diapazone radiochastot)

PERIODICAL: Izvestiya Akademii Nauk, Vol. XX, #11, pp 1348-1356 1956, USSR, Seriya fizicheskaya

ABSTRACT: The subject of this article is the study of magnetic spectra of polycrystal ferrites of various composition, sintered at various temperatures, and investigated in a state of absolute zero and in a state of residual magnetization.

The following ferrites were investigated: Li-Zn, Ni-Zn-Mg, Ni-Zn-Cu, Ni-ZnOBe and Ni-Zn-ferrites. Their initial magnetic permeability at a temperature of 20°C had the values from 100 to 600 gauss/oersted. The investigations included 3 independent groups of experiments, namely:

1. Investigation of the Ni-Zn-Be-ferrite in various states of residual magnetization,

Card 1/3

TITLE: Investigation of Magnetic Spectra of Mixed Ferrites in the Residual Magnetization State in the Band of Radio Frequencies (Issledovaniye magnitnykh spektrov smeshannykh ferritov v sostoyanii ostatochnoy namagnichennosti v diapazone radiochastot)

2. Investigation of magnetic spectra of mixed ferrites of various chemical composition,
3. Investigation of magnetic spectra of mixed ferrites produced at various temperatures of sintering.

The results of investigations in the state of absolute zero and in the state of residual magnetization have shown:

1. That magnetic spectra of mixed ferrites are mainly of resonance character, independent from the dimensions of the core.
2. That the clearer the resonance character of spectra is manifested, the less are the losses in the ferromagnetic substance in the beginning of resonance rise of permeability,

Card 2/3

TITLE: Investigation of Magnetic Spectra of Mixed Ferrites in the Residual Magnetization State in the Band of Radio Frequencies (Issledovaniye magnitnykh spektrov smeshannykh ferritov v sostoyanii ostatochnoy namagnichennosti v diapazone radiochastot)

3. That the relative significance of the processes of shifting and rotation in mixed ferrites depends on their composition and sintering temperature.
4. That magnetization in some types of ferrites proceeds actually only by the shifting of the borders and that the radiofrequency dispersion can be accounted for by the inertia of their fluctuating effective mass.

The bibliography lists 34 references, of which 10 are Slavic (Russian). The article contains 14 graphs and 3 tables.

INSTITUTION: No indication

PRESENTED BY:

SUBMITTED: No date

AVAILABLE: At the Library of Congress

Card 3/3

Fomenko, L.A.

538.221

3228. INVESTIGATION OF THE MAGNETIC SPECTRA OF SOLID SOLUTIONS OF SOME NiZn FERRITES IN THE RADIO-FREQUENCY RANGE. L.A. Fomenko.
Zh. eksper. teor. Fiz., Vol. 30, No. 1, 18-29 (1956). In Russian.

Results of investigation of magnetic spectra of NiZn ferrites with initial permeability values μ_a = 200, 400 and 2000 in the frequency range 0.2-60 Mc/s are presented. The method of measurement of the spectrum and of avoiding possible errors is discussed. The samples were investigated in the absolute zero state, in the residual magnetization state and at various field strengths of the constant magnetizing field. It is shown that the ferrite spectra are of a resonance or relaxation nature and are practically independent of the core dimensions; they can be explained by dispersion of the ferromagnetic substance; this dispersion for ferrites with $\mu_a \approx 2000$ is probably due to the inertia of the effective boundary mass, and for ferrites with $\mu_a \approx 200$ to precession of the magnetization vector in the effective anisotropy field of the ferrite substance.

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AUTHOR: FOMENKO, L.A.

TITLE: On the Problem of the Mechanism of Magnetization Processes in the Case of Very Weak Fields in Some NiZn-Ferrites.

PERIODICAL: Zhurnal Eksperimental'noi i Teoret.Fiziki, 1956, Vol 31, Nr 6, pp 1092-1093 (U.S.S.R.)

Received: 1 / 1957 Reviewed: 3 / 1957

ABSTRACT: G.W.RATHENAU and J.F.FAST, Physica, Amsterdam, 21, 964 (1955) investigated the initial permeabilities μ_a of the NiZn-ferrites $Ni_{0,5}Zn_{0,5}Fe_2O_4$ and $Ni_{0,36}Zn_{0,64}Fe_2O_4$ at various external voltages σ_a. The experimental data were explained in the above mentioned work by rotation processes of the magnetization vector in the interior of the ferromagnetic domains. The agreement of the experimental data obtained with the theoretical formula for rotation processes derived from them was considered to be a basis for such a point of view by RATHENAU and FAST. The formula is: $\Delta \mu_a = (9/40\pi)(\lambda_s \sigma_a \mu_a/I_s^2)\mu_a$. Here I_s denotes the saturation magnetization and λ_s - saturation magnetostriction. The above formula was obtained by inserting the value K obtained from the equation $\mu_a \operatorname{curl}^{-1} = 2\pi I_s^2/K$ into the formula

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On the Problem of the Mechanism of Magnetization Processes in the Case of Very Weak Fields in Some NiZn-Ferrites.

$\Delta\mu_a = (1/5)(3/2)\ \lambda_s\sigma_a\ \mu_a/(2/3)K = 9\ \lambda_s\sigma_a/20K\ \mu_a$. On this occasion $\mu_{a\ curl} = \mu_a$ was put arbitrarily in the aforementioned work, which predetermines the conclusion arrived at by the aforementioned authors. P.A.MILES, Nature, 174, 177 (1954) published experimental values of the anisotropy constant K_1 and of the interior field strengths H_i of some NiZn-ferrites. Thus MILES found for $Ni_{0,55}Zn_{0,45}Fe_2O_4$ $K_1 = 105\ I_s$ and $H_i = 190$ Ørsted. With these values one obtains $K = H_i I_s = 95\ I_s$, which agrees well with the value of K_1. By inserting the corresponding value of anisotropy one obtains by using $I_s = 335$ G and $\lambda_s = 10.10^{-6}$ for the first sample $\Delta\mu_a = 0,013\ \mu_a$ kg/mm^2, whereas the corresponding quantity amounts to $0,15\ \mu_a$ kg/mm^2.

In the case of a displacement of boundary surfaces the coefficient 1/5 in the second formula of this work must be considerably increased. Proceeding from experimental data it is possible to show that this coefficient must have the value ~ 2 or ~ 3 for the

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On the Problem of the Mechanism of Magnetization Processes in the Case of Very Weak Fields in Some NiZn-Ferrites.

first and second NiZn-ferrite sample respectively. This is of the same order of magnitude as the value for 45% permalloy obtained by R.M.BOZORTH and H.J.WILLIAMS, Rev.Mod.Phys.17,72(1945). In the case of a displacement of boundary surfaces the magnetization processes in very weak fields can be explained in accordance with the general theory of the reversible displacement of boundaries by KONDORSKIJ by the influence of inclusions and internal voltages. Magnetoelastic energy probably plays an important part in some ferrites. The author tried to estimate the values of $\mu_{a,v}$ (the index v here refers to the displacement) of the NiZn-ferrites and found $\mu_{a,v}$=235 G/Ørsted for the first and $\mu_{a,v}$=1820 G/Ørsted for the second sample.

ASSOCIATION: Central Laboratory for the Elimination of Industrial Radio Disturbances.

PRESENTED BY:

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FOMENKO, L.A.

AUTHOR: Fomenko, L. A. 48-9-21/26

TITLE: A Note on the Magnetic Radiofrequency Spectra of Mixed Ferrites (Radiochastotnyye magnitnyye spektry smeshannykh ferritov)

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol. 21, Nr 9, pp. 1310-1317 (USSR)

ABSTRACT: A short abstract of the new experimental data on the investigation of the magnetic radiofrequency spectra of mixed ferrites, which were conducted in very weak fields in the frequency range of from 0,2 to 60 Megacycles is contained in this paper. The results are discussed. The investigation of the spectra was conducted according to the method described elsewhere by the author (ZhETF, 21, 1201, 1951, FMM, 2, 22, 1956 and others) on torus-shaped samples of Ni-Zn-, Ni-Zn-Cu-, Ni-Zn-Be-, Ni-Zn-Mg-, Li-Zn- and Mn-Zn ferrites with an initial permeability from a few dozen to 2000 $G.Oe^{-1}$. The examination of the magnet spectra of normal production samples of the Ni-Zn- ferrites in their state of absolute rest showed that smaples showing an approximate identical composition and about the same values of initial permeability μ_a and of saturation magnetization J_s, are characterized by approximately similar magnetic spectra. They can display a resonance as well as a relaxation character, even in the case of identical

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A Note on the Magnetic Radiofrequency Spectra of Mixed Ferrites. 48-9-21/26

technology. The investigation of the magnetic spectra of the remanent state of the substance showed that the quantitative relations between the spectra of the absolute rest state and the remanence are strongly dependent on the composition of the ferrite samples, the sintering temperature and the method of cooling. In a few Ni-Zn- samples and other ferrites, which were sintered at an almost optimum temperature, the domiating importance of the displacement processes was established. It is shown that the tangent of the ferrite loss angle reaches its optimum value at the temperature of the "thermic maximum of the magnetic radiofrequency viscosity". The temperature dependence of the magnetic spectra in the range of low temperatures of ferrite samples, in which displacement processes are dominant, can be expressed at the same time by the theory of inclusions by Kersten and by the theory of stress by Kondorskiy. There are 7 figures and 27 references, 1o of which are Slavic.

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Card 2/2

FOMENKO, L.A.

AUTHOR: Fomenko, L. A.

TITLE: Note on the Magnetic Spectra of Diamagnetic Substances of the "Alsifer" Type (O magnitnykh spektrakh magnitodielektrikov tipa al'sifer). 48-9-22/26

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1957, Vol. 21, Nr 9, pp. 1318-1319 (USSR)

ABSTRACT: Measurements of the magnetic spectra were conducted on samples of diamagnetica of the type "Alsifer" TCh-6o and TChK-55 resembling a torus in very weak fields according to the method described by the author in ZhETF, 3o, 18, 1956. It was attempted to compute the frequency characteristics obtained here under the assumption that these characteristics are essentially determined by the eddy currents generated in the particles of the diamagnetic substance. The model used for the computation was the one of the idealized diamagnetic substance (proposed by M. Kornetzki and A. Weis, Wissenschftl. Veröffent. S.W. 15, H 2, 95, 1936). The comparison of the computations with experiment showed that the results, in general, disagree by less than ± 2o%. There are 1 figure and 6 references, 5 of which are Slavic.

AVAILABLE: Library of Congress

Card 1/1

AUTHOR: Fomenko, Lev Aleksandrovich, Chief Designer of the Leningrad NII SOV/ 161-58-1-7/33

TITLE: Influence of Metallization of Ferrite Cores Upon the Charact. - of Radiofrequency Spectra (Vliyaniye metallizatsii ferritovykh serdechnikov na kharakter radiochastotnykh spektrov pronitsaye mosti ikh tela)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Elektromekhanika i avtomatika, 1958, Nr 1, pp. 38 - 48 (USSR)

ABSTRACT: Polivanov (Ref 15) from theoretical considerations predicted an influence of a metallization of cores on the magnetic spectra of ferrites, which had hitherto not been found in experiments. This investigation was intended to check this assumption and to obtain the data necessary for a quantitative estimation of this phenomenon. Toroidal samples with rectangular cross-sections of varying shape from Mn-Zn ferrites of the type "Oksifer M-2000" and from Ni-Zn ferrites of the type "Oksifer M-2000" were used as test samples. They were sintered at 1300 - 1330°C (Refs 19,20). The measurement of the magnetic spectra of metallized cores was performed according to the

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method described in reference 9 with very weak alternating fields H < 1 mOe. The metallization of the surface of the sample was done galvanically. The magnetic spectra depends upon the metallization and upon the electric conductivity of the coating, as was predicted by Polivanov. This appears from the investigation of cores, metallized and not metallized on two cylindrical surfaces, which consist of Mn-Zn ferrites, that according to theoretical predictions by Polivanov the character of magnetic spectra of bodies is dependent upon the metallization and upon the specific electric conductivity of the coating. The approximate quantitative accordance of the experimental data with the theoretical computations shows the correctness of the assumption that the electromagnetic field propagates primarily as two plane oppositely directed waves. It was found that a metallization causes a shift of the magnetic spectra of ferrite bodies towards lower frequencies. The influence of the metallization upon the general shape of the spectra is increased when the area of metallized surfaces is increased. In this case the nature of the spectra tends more and more towards a resonance character. The experimental

evidence and in particular the agreement with the newly deduced formula (6) indicate that the bulk resonance is the basic mechanism of this phenomenon. It determines the resonance character of the bulk spectra and the modification of the spectrum under various experimental conditions. Formula (5) and (7)are given, which permit to estimate the frequency of the bulk resonance of metallized cores with a varying metallized surface. They incorporate the factor ν which takes into account the modification of the conditions for the propagation of the field in the core. A new and simple method is proposed for the qualitative estimation of the rate of progress of the bulk resonance according to the"method of metallization". There are 5 figures, 2 tables, and 29 references, 26 of which are Soviet.

ASSOCIATION: Leningradskiy nauchno-issledovatel'skiy institut (The Leningrad Scientific Research Institute)

Influence of Metallization of Ferrite Cores Upon the Character of Radiofrequency Spectra SOV/161-58-1-7/33

SUBMITTED: February 1, 1958

Card 4/4

AUTHOR: Fomenko, L. A. 57-28-3-12/33

TITLE: Magnetic and Electric Radiofrequency-Spectra of Permeability of the Body and Substance of MnZn-Ferrites (Radiochastotnyye magnitnyye i elektricheskiye spektry pronitsayemosti tela i veshchestva MnZn-ferritov)

PERIODICLA: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 3, pp.506-510 (USSR)

ABSTRACT: Analogous to the paper by Brockman, Dowling, Steneck (Reference 1) the author here investigates the magnetic and electric spectra of permeability of the bodies $\mu' = \mu_1 - j\mu_2$ and $\varepsilon' = \varepsilon_1 - j\varepsilon_2 = \varepsilon_1 - j(\varepsilon'_2 + 1,8.10^{12}/f\varrho)$ and the substances $\mu' = \mu - j\varrho'$ and $\varepsilon' = \varepsilon - j\sigma' = \varepsilon - j(\sigma'' + 1,8.10^{12}/f\varrho)$ of MnZn-ferrites with μ radiofrequency $\approx \mu_2 \approx$ 1000 ÷ 4000 Gauss/Oersted (measured at $f = 2.10^5$ cycles). The spectra were measured in weak magnetic $H < 1$ m/Oersted, and in electric $E < 1$ V.cm^{-1}, alternating

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Magnetic and Electric Radiofrequency Spectra of Permeability of the Body and Substance of MnZn-Ferrites

fields in a comparatively wide frequency range of from 2.10^5 + 6.10^7 cycles with the inclusion of the unexplored range of the negative μ_1-1-values. Moreover the specific direct current resistances ϱ of the investigated ferrites were measured. The metal coating of the surface of the sample was carried out by copperplating in cyanogen baths. The measurement of the electric parameters was performed in an axial, radial and longitudinal direction of the cylindrical ring (toroid). The investigation of the body spectra was performed on toroid-cores according to the method of reference 2. The investigation of the substance spectra was performed 1) according to the method of the "thin sample" and 2) according to the method of "two unsymmetrical tests" by Polivanov (Reference 3). The investigated ferrites were samples of domestic production of the type Oksifer M-1000, Oksifer M-2000 and Oksifer M-3000, produced in the laboratory Shol'ts (Reference 4). - The characteristic peculiarities of the magnetic spectra of MnZn-ferrite-core-bodies which highly differ from those of References 2 and 5 are: 1) a distinctly marked drop of the dispersion curves

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Magnetic and Electric Radiofrequency-Spectra of Permeability of the Body and Substance of MnZn-Ferrites

(dispersiya) $\mu_1(f)$ to the $\mu_1 - 1 = 0$ values at a frequency f_f at which $tg\,\Delta = \mu_2/(\mu_1 - 1) = \infty$ holds. 2) The occurrence of a domain of negative $\mu_1 - 1$-values. 3) A relatively high value of the absorption maximum $\mu_{2max}/\mu_{radiofrequency}$ at the frequency f_μ. - The shape of the curves of dielectric permeabilities of the ferrite-bodies also is specific. The experimental results obtained here agree with those of References 1 and 6, as well as with theory. They show distinctly that the magnetic radiofrequency spectra can at least be expressed by two dispersion mechanisms: 1) by the dispersion of the core-body and 2) by the dispersion of the ferrite substance. The investigation of the MnZn-ferrites in the remanent state apparently indicate that the reversible magnetization processes in these ferrites are essentially dependent on the foreign inclusions (which is in agreement with the References 11 and 18) and mainly take

Magnetic and Electric Radiofrequency-Spectra of Permeability of the Body and Substance of MnZn-Ferrites

place as displacement processes of the 90- and 180-degree boundaries. There are 4 figures, and 20 references, 9 of which are Soviet.

SUBMITTED: July 25, 1957

1. Manganese-zinc ferrites---Spectra 2. Radiofrequency spectrum analyzers---Applications 3. Manganese-zinc ferrites---Magnetic factors 4. Manganese-zinc ferrites---Electrical factors

AUTHOR: Fomenko, L. A.

53-64-4-4/11

TITLE: Magnetic Spectra of Ferrites
(Magnitnyye spektry ferritov)

PERIODICAL: Uspekhi Fizicheskikh Nauk, 1958, Vol. 64, Nr 4, pp. 669-731 (USSR)

ABSTRACT: This work consists of 4 chapters. In the first, the introduction, the problem and its treatment are dealt with. In the second chapter the author discusses the radio frequency dispersion and the ultra-high frequency dispersion at first for polycrystalline ferrites (MnZn-, FeMg-, NiZn-ferrites, - Fomenko, refs. 28, 38; furthermore refs. 22, 23, 26, 27, 28-51, 77, 180-186), the gyromagnetic resonance (here the data of the various ferrites are compiled in two tables and a great number of mainly foreign publications are mentioned), the dispersion of the core body, the structural dispersion for the frequency range of from 200-3000 megacycles on sintered specimen of Mg-, NiZn-, CuZn- and CuPb-ferrites, especially on FeMg--ferrites of the "Ferramik A"-type. In other chapters

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the powdered polycrystalline ferrites (1 - 4000 megacycles) and monocrystalline ferrites (Ni- and Fe-ferrites) are dealt with. After this the low frequency dispersion and the frequency dependence of the permanent magnetization are discussed by means of numerous examples. The last two chapters of this part deal with the "infraradiofrequency" dispersion and the "infrared" dispersion by means of a great number of mainly non-Soviet references. The third chapter of this work with the title "Magnetic Radio Frequency Spectra of Polycrystalline Ferrites" first deals with the temperature dependence of the magnetic spectra; 2 diagrams are given for a frequency range of from 1o-1ooooo megacycles and for temperatures of from +138 to -196°C for "Ferramik A". A table gives the data pertaining to these temperature values. Then the author discusses the dependence of the characters of magnetic spectra on the composition of the ferrites by means of several diagrams and tables, and the double and single dispersion spectra of NiZn-ferrites (frequency range 3-3000 megacycles, the "Ferrokskub IV, A, B, C and D" ferrite types at 15-300 G/Oe. Also in this case numerous diagrams are given. In the fourth chapter the author gives new experimental data

concerning the radio frequency spectra of polycrystalline ferrites; only in this part more than 100 references are mentioned and partly discussed. First the magnetic spectra of the absolute zero state and the state of the remanent magnetization of ferrites are dealt with by means of a series of diagrams; then the author discusses the influence of some technological factors on the character of the magnetic radio frequency spectra, as for instance, the influence of the sintering temperature, the influence of sintering itself and of the state of the ferrites, the influence exerted by the hardening process, the pre-annealing of the briquetted specimen material a. o. The last chapter deals with the magnetic spectra within the wide temperature interval (NiZn-ferrites of the "Oksifer-2000-1"-type at from 200 to 2000 G/Oe, NiZnCu-ferrites at α = 370 G/Oe).
There are 39 figures, 4 tables and 220 references, 63 of which are Soviet, 129 are English, 12 German and French; Japanese, Dutch, Czech and Latvian are 3 each.

FOMENKO, LA., Cand Tech Sci -- (diss) "Magnetic spectra of manganese-zinc ferrites." Mos, 1959, 20 pp (Min of Higher Education USSR. Mos Order of Len Power Engineering Inst. Chair of the Theoretical Principles of Electrical Engineering) 150 copies (KL, 36-59, 116)

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AUTHOR: Fomenko, L. A. SOV/126-8-1-21/25

TITLE: On the Problem of Complex Permeability of Magnesium Ferrites

PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 8, Nr 1, pp 150-152 (USSR)

ABSTRACT: Chiron and Prache (Ref 1) have described experimental results on the magnetic spectrum of magnesium ferrites with initial magnetic permeability $\mu_a = 9$ gauss/oersted (100-3000 Mc/s). The experimental data were presented in the form of curves $q' = \varphi_1(q'')$ using the frequency as a parameter. q' and q'' are connected with a complex magnetic permeability $\mu' = \mu - j\rho'$ of the ferrite by the relation

$$q' + jq'' = (\mu_a - 1)/(\mu' - 1)$$

so that

$$\mu - 1 = (\mu_a - 1)\frac{q'}{q'^2 + q''^2}; \quad \rho' = (\mu_a - 1)\frac{q''}{q'^2 + q''^2} \qquad (1)$$

The figure given in the present paper gives μ' as a

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On the Problem of Complex Permeability of Magnesium Ferrites

function of frequency and was calculated from the results given in Ref 1. In this figure curve 1 is the dispersion curve and curve 2 is the absorption curve. A consideration of these curves shows that:
1) the ultrahigh frequency dispersion in magnesium ferrites may be described by the gyromagnetic resonance;
2) the radio frequency dispersion can only be described by processes involving the displacement of boundaries.
There are 1 figure and 7 references, 2 of which are Soviet, 4 English and 1 French.

SUBMITTED: June 12, 1958

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4 (3)

AUTHOR: Fomenko, L. A. SOV/48-23-3-11/34

TITLE: Investigation of the Dispersion of Permeability and the Absorption in Mn - Zn-ferrites (Issledovaniye dispersii pronitsayemosti i absorbtsii v Mn-Zn ferritakh). 1. Dispersion of a Body (1. Dispersiya tela)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 3, pp 329-335 (USSR)

ABSTRACT: In the work reported in the present paper the spectra of a body of nonmetallized cores of the Mn-Zn-ferrites of different size were investigated in detail. The magnetic spectra of samples of different size are given in figures 1 and 2. It may be seen from the curves that in the case of ferrites with approximately equal values of r-f-permeability μ_{rf} (at 0.2 megacycles) the following processes take place in the case of an enlargement of the cross section of the core: a) the frequencies f_f and f_h (at which $\mu_1 - 1 = 0$ and $\mu_1 = \mu_{2min}$, respectively) gradually decrease; b) the relative maxima of the adsorption curves μ_{2max}/μ_{rf}

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and the dispersion curves μ_{1max}/μ_{rf} increase; c) the peaks of the curves μ_2 which first are blurred gradually become more distinct. Also the dependence curves of the loss angle tangent of the body $tg\bar{\Delta}(f)$ have a characteristic shape (Fig 3). By reducing the cross sections of the samples by means of loops curves are obtained similar to those represented in figures 1 and 2. Figures 4 and 5 show electrical spectra of the core bodies of different size which are characteristic of Mn-Zn-ferrites. In agreement with an earlier paper (Ref 31) it was found that the metallization of the Mn-Zn-ferrite cores brings about a considerable displacement of magnetic spectra towards lower frequencies (Fig 6 and Table). In the case of Ni-Zn-ferrites this phenomenon occurs in a strongly weakened form (Fig 7). On the basis of the experiments carried out a phenomenological description of the spectra of Mn-Zn-bodies may be given and the following may be shown: 1) The spectra with two different dispersion mechanisms - dispersion of the body and dispersion of the substance - may be described. 2) A large range of the

$\mu_1 - 1 < 0$ values together with the dependence $\mu_{2\ max}/\mu_{rf} > 0.5$ and $\mu_{1\ max}/\mu_{rf} > 1$ points to the resonance character of the body dispersion. 3) The volume resonance may be regarded as the main mechanism causing the change in the nature of the spectrums. 4) The curves $\overline{\mu'}(f)$ depend on the degree of metallization of the cores. The method of metallization may especially be applied for evaluating qualitatively the development of volume resonance in the sample. 5) The dispersion of the body of Mn-Zn-ferrites can be easily controlled thus making possible the modulation of dispersion and absorption phenomena. There are 7 figures and 37 references, 9 of which are Soviet.

24 (3)

AUTHOR: Fomenko, L. A.

SOV/48-23-3-12/34

TITLE: Investigation of the Dispersion of Permeability and Absorption in Mn-Zn-ferrites (Issledovaniye dispersii pronitsayemosti i absorbtsii v Mn-Zn ferritakh). 2. Dispersion of the Substance (2. Dispersiya veshchestva)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 3, pp 336-342 (USSR)

ABSTRACT: In the work reported in this paper the investigation of the spectra of highly permeable Mn-Zn-ferrite substances was continued by applying different methods. Samples Nr 30 and 43 of approximately the same size with cut surface layers were investigated. The cores showed strongly differing electric parameters; their μ_{rf}-values, however, were similar. Two methods were applied in the investigation: 1) method of the asymmetric experiments according to Polivanov (Ref 34), 2) approximate method of three asymmetric experiments which is a modification of the method from reference 34 suggested by the author. The results obtained in the measurements of the spectra of the body of Nr 43 and 30 are shown in

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figures 1, 2, 4, and 5. It may be seen from the experiments that the method applied was correct. Especially, the macroscopic anisotropy of the electric properties of Mn-Zn-ferrites is unimportant. The magnetic and electric spectra of the ferrite substance permeabilities obtained in the case of equal composition and equal methods are relatively similar. This may be concluded from the good agreement between the experimental and theoretical data (Figs 4 and 5). A formula (6) is given for the computation of the spectra of the body of ferrite cores with rectangular cross section. Formula (7) for the frequency of the volume resonance derived by the author is more precise and substantiated:

$$(7)\quad f_{oo} = \frac{3 \cdot 10^{10}}{\sqrt{\mu\varepsilon/\xi_{11}}} \sqrt{\frac{s - \sqrt{s^2 - 1.372\,U}}{0.686\,U}} = \frac{3 \cdot 10^{10}}{\sqrt{\mu\varepsilon/\xi_{11}}}\,\eta$$

$s = 0.657(1 + tg^2\Delta) + 0.686(1 - tg\Delta \cdot tg\delta)$;

Card 2/3 $U = (1 + tg^2\Delta)(1 + tg^2\delta)$. The values of the coefficient η

computed according to formula (7) are graphically represented in figure 3. η - function of the magnetic loss angle tangent $tg\Delta = \mu'/\mu$ and the electric loss angle tangent $tg\delta = \sigma'/\varepsilon$ of the ferrite substance.

$\xi = 0.25\left[\left(\frac{l}{n}\right)^2 + \left(\frac{q}{h}\right)^2\right]$; l and q = odd numbers determining the order of resonance. There are 6 figures and 1 references, 2 of which are Soviet.

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FOMENKO, L. A.

PHASE I BOOK EXPLOITATION SOV/4893

Vsesoyuznoye soveshchaniye po fizike, fiziko-khimicheskim svoystvam ferritov i fizicheskim osnovam ikh primeneniya. 3d, Minsk, 1959

Ferrity; fizicheskiye i fiziko-khimicheskiye svoystva. Doklady (Ferrites; Physical and Physicochemical Properties. Reports) Minsk, Izd-vo AN BSSR, 1960. 655 p. Errata slip inserted. 4,000 copies printed.

Sponsoring Agencies: Nauchnyy sovet po magnetizmu AN SSSR. Otdel fiziki tverdogo tela i poluprovodnikov AN BSSR.

Editorial Board: Resp. Ed.: N. N. Sirota, Academician of the Academy of Sciences BSSR; K. P. Belov, Professor; Ye. I. Kondorskiy, Professor; K. M. Polivanov; Professor; R. V. Telesnin, Professor; G. A. Smolenskiy, Professor; N. N. Shol'ts, Candidate of Physical and Mathematical Sciences; E. M. Smolyarenko; and L. A. Bashkirov; Ed. of Publishing House: S. Kholyavskiy; Tech. Ed.: I. Volokhanovich.

PURPOSE: This book is intended for physicists, physical chemists, radio electronics engineers, and technical personnel engaged in the production and use of ferromagnetic materials. It may also be used by students in advanced courses in radio electronics, physics, and physical chemistry.

COVERAGE: The book contains reports presented at the Third All-Union Conference on Ferrites held in Minsk, Belorussian SSR. The reports deal with magnetic transformations, electrical and galvanomagnetic properties of ferrites, studies of the growth of ferrite single crystals, problems in the chemical and physicochemical analysis of ferrites, studies of ferrites having rectangular hysteresis loops and multicomponent ferrite systems exhibiting spontaneous rectangularity, problems in magnetic attraction, highly coercive ferrites, magnetic spectroscopy, ferromagnetic resonance, magneto-optics, physical principles of using ferrite components in electrical circuits, anisotropy of electrical and magnetic properties, etc. The Committee on Magnetism, AS USSR (S. V. Vonsovskiy, Chairman) organized the conference. References accompany individual articles.

Ferrites (Cont.) SOV/4893

Telesnin, R. V., and A. M. Ovchinnikova. Temperature Dependence of the Magnetic Viscosity of Ferrite Garnets of Yttrium and Gadolinium 325

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Fomenko, L. A. The Effect of Mechanical Stresses on the Character of Radiofrequency Magnetic Spectra of Ferromagnetic Semiconductors 474

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S/194/61/000/008/080/092
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24,2200 (1144, 1147, 1164)

AUTHOR: Fomenko, L.A.

TITLE: The effect of mechanical stresses on the character of radiofrequency magnetic spectra of ferrite semiconductors

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 8, 1961, 53, abstract 8 I344 (V sb. Ferrity. Fiz. i fiz.-khim. svoystva, Minsk, AN BSSR, 1960, 474-482)

TEXT: The dependence has been investigated of magnetic spectra of certain types of Russian-produced toroidal samples of Ni-Zn, Ni-Zn-Cu and of Mn-Zn ferrites on external mechanical radial compression stresses. It was established that with the applied stresses the initial permeability μ_a of ferrites decreases and that the spectra of Mn-Zn ferrites are shifted towards high frequencies. No noticeable shift of spectra has been observed with Ni-Zn

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The effect of mechanical stresses...

and Ni-Zn-Cu. The shift of Mn-Zn ferrite spectra may be ascribed solely as due to the effect of space resonance. This resonance is absent in Ni-Cu-Zn and Ni-Zn ferrite which explains the reason for their spectra being independent of the Mn-Zn ferrite spectra. This assumption was proved experimentally to be correct from an investigation of a compressed Mn-Zn ferrite sample, in which the space resonance was found to be weak. The negligible dependence of the frequency of max. absorption of ferrite material on the degree of compression was observed in all analyzed cores. 20 references.
[Abstracter's note: Complete translation]

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S/126/60/010/004/005/023
E201/E491

AUTHOR: Fomenko, L.A.

TITLE: On the Mechanisms of Formation of Separate Dispersion Regions in the Permeability Spectra of Ferromagnetic Semiconductors

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.4, pp.534-537

TEXT: The paper is a brief review of Western and Soviet (including the author's own) work on the subject of the permeability spectra of ferrites with one, two or three dispersion regions. The author concludes that formation of separate dispersion regions is affected by the ratio of the anisotropy constants and the magnetoelastic energies, by the saturation magnetization and by the sintering temperature. With increase of the sintering temperature there is a relaxation of boundaries, related to diffusion of electrons, which may displace the radiofrequency dispersion region towards lower frequencies. Such a displacement explains, for example, the two-dispersion spectrum of quenched nickel ferrites. There are 38 references: 10 Soviet, 21 English, 1 German, 3 French, 1 Dutch, 1 translation from English into Russian and 1 mixed (English and

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E201/E491

On the Mechanisms of Formation of Separate Dispersion Regions in the Permeability Spectra of Ferromagnetic Semiconductors

German).

ASSOCIATION: Leningradskiy filial nauchno-issledovatel'skogo institute Ministerstva svyazi SSSR (Leningrad Branch of the Scientific Research Institute of the Ministry of Communications, USSR)

SUBMITTED: February 17, 1960

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89282

9.4300 (1043, 1137, 1155)

S/181/61/003/001/015/042
B006/B056

AUTHOR: Fomenko, L. A.

TITLE: Magnetic spectra of a mixed nickel-zinc-copper ferrite in the state of residual magnetization at various temperatures

PERIODICAL: Fizika tverdogo tela, v. 3, no. 1, 1961, 132-141

TEXT: The magnetic spectra, i.e., the curves $\mu(f)$ and $\varrho'(f)$ (permeability $\mu' = \mu - j\varrho'$) of mixed polycrystalline ferrites has been investigated repeatedly (among others by the author himself), but mainly in the absolute-zero state. A detailed study has now been made of the temperature dependence of the magnetic spectra of ferrites in the state of absolute zero and residual magnetization. Toroidal Ni-Zn-Cu ferrites (21% NiO, 4% CuO, 26% ZnO, 49% Fe_2O_3, t_{sint} = 1140°C given in mole%) were used for the purpose. The method of examining the spectra has been described by the author in previous papers. Before the measurements, the specimens were maintained at a certain temperature t for some time. Absolute-zero state was attained by heating the specimens beyond Curie point, after which they

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Magnetic spectra of a mixed...

were magnetically shielded and slowly cooled. The domains were then in a chaotically disordered condition. The state of residual magnetization I_R was attained after removing a constant field of 200 oe. The Curie point Θ of the specimens was at 238°C. Results are illustrated by tables and diagrams. Fig. 1 shows the temperature dependence of the magnetic spectra of the mixed ferrite. Curves 1 and 2 refer to the absolute-zero state; from their course it may be seen that with increasing temperature, the resonance character of the spectra goes over into a relaxation character, and that the frequency f_u (at which maximum absorption occurs) first decreases, passes through a minimum at $t \approx 226^\circ C$, and increases again. $f_u(t)$ may be approximated by (1): $f_u \approx C \cdot I_s/(\mu_a - 1)$; this relation holds for ferrites with moderate sintering temperatures t_s. C is a constant which is nearly equal to the gyromagnetic ratio of the electron spin (e/mc = 17.6 Mc/oe). For the data given in Table 1, C was calculated from (1) at t=-80°C, and the value obtained (8.73 Mc/oe) was used for all t values. μ_a is the initial magnetic susceptibility. Curves 3 and 4 relate to a residual-magnetization state; here, the character of the spectra, in general, is conserved. Curves 5 and 6 correspond to states

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with residual-magnetization produced at 20°C and 0.7 oe, and 161°C and 200 oe, respectively. The spectra recorded for residual magnetization show that at 20°C, if $I_R/I_s = 0.54 \simeq 0.5$, the ratio $(\mu_{aR}-1)/(\mu_a-1)-1$ is equal to 0.48. This corresponds to a value which was obtained by S. V. Vonsovskiy and Ya. S. Shur for $\alpha_R = 0.06$ (α_R is a parameter depending upon the intensity distribution of the internal magnetic field; I_s is the saturation magnetization) by means of the formula $(\mu_{aR}-1)/(\overline{\mu}_a-1) = 0.328\ 1+8.15\alpha_R(1-\alpha_R)$ (3). The values measured for $I_R/I_s \simeq 0.5$ and $(\mu_{aR}-1)/(\mu_a-1) = 0.328$ correspond to (3) at $\alpha_R = 0$. The agreement of the data obtained by investigating the spectra by means of formula (3) shows that the displacement processes of the right-angled boundaries in this ferrite play a special part. The reversible magnetization of the ferrite at the highest temperature is explained by rotation of the magnetization vector in the anisotropy field of internal stresses. The dispersion observed is related to diffusion processes; because of the high resistivity of $\rho > 10^6$ ohm·cm, no low-frequency dispersion connected with electron diffusion occurs. At all other temperatures, the main part is

probably played by processes of boundary displacement, which in the range of -80 - 109°C certainly dominate. The resonance character of the spectra may be described by boundary resonance according to Dering. A comparison between the author's results and the theories by Kersten and Kondorskiy indicates that Kondorskiy's stress theory is to be favored. There are 2 figures, 3 tables, and 31 references: 17 Soviet-bloc and 11 non-Soviet-bloc.

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Legend to Table 1: μ_a and μ_{aR} are given in gauss/oersted, the coercive force H_c in oersteds, the frequencies in Mc/sec.

Таблица 1

t°, C	μ_a, гс/эрст.	μ_{aR}, гс/эрст.	f_a, гс	f_R, гс	H_c, эрст.	f_u, мгц	f_{uR}, мгц	f_u [ω(1)], мгц	$\frac{\mu'_{max}}{\mu_a}$	$\frac{\mu_{max}}{\mu_a}$
−80	143	57	460	290	1.04	28	45	28	0.58	1.21
20	370	177	350	190	0.55	10	16.5	8.3	0.57	1.18
109	720	485	264	98	0.4	5.0	6.5	3.2	0.52	1.15
161	998	796	207	75	0.27	3.0	3.6	1.8	0.5	1.08
210	1380	1200	139	57	0.17	1.4	1.9	0.88	0.46	1.03
218	1290	1030	112	—	—	0.8	1.3	0.76	0.46	1.0
226	860	780	72	—	—	0.8	0.9	0.73	0.44	1.0
232	32.5	32.5	10	—	—	6.0	6.0	2.8	0.23	1.0

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Legend to Fig. 1: The ordinates of the diagram show μ/ρ' in gauss/oersted, the abscissas f in Mc/sec.

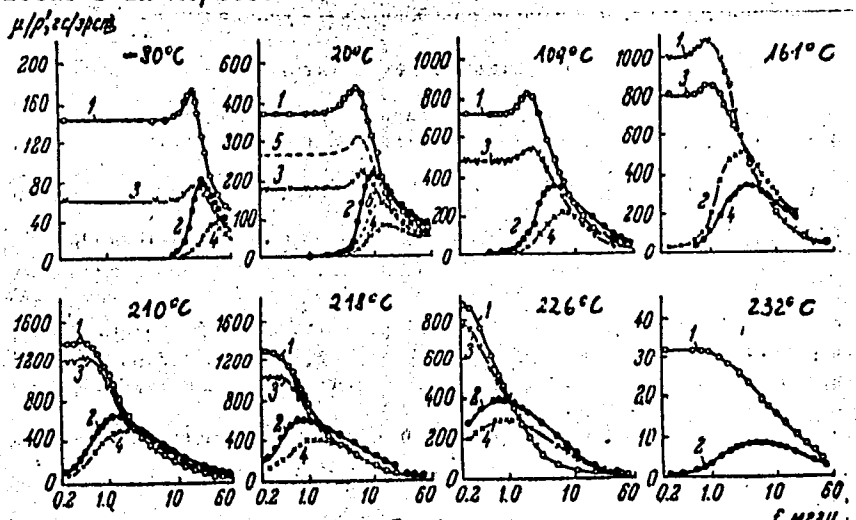

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Fig. 1

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9.4300 (and 1035, 1043, 1137)

AUTHOR: Fomenko, L. A.

TITLE: The problem of dispersion mechanisms in lithium ferrite

PERIODICAL: Fizika tverdogo tela, v. 3, no. 2, 1961, 328-330

TEXT: The present paper first discusses a work by F. Voigt (Ann.Phys. v.1, p.86, 1958) in detail, who, for the purpose of explaining the mechanism of r-f dispersion, investigated the magnetic spectra of the reversible permeabilities of $LiFe_5O_8$ (initial permeability $\mu_a \approx 30$ gauss/oersted) in the range of from 10 - 8645 Mc. Voigt's attempt to explain the experimental results and the conclusions drawn, are believed, by the author of the present paper, to be in need of rechecking. This, above all, because, contrary to Voigt's conclusions concerning the experimental results, there is yet another powerful argument in favor of the predominating role played by reversible processes in the shifting of the boundaries between ferromagnetic ranges in zero- and weak H-fields within the r-f region, and also for the predominating importance of the

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The problem of dispersion...

rotational processes in the ultrahigh frequency range. This is explained on the basis of considerations to Figs. 7 and 8 (not shown here) in Voigt's paper. For the rf and the shf dispersion range there results a shift toward high frequency also in weak magnetizing fields and a dependence on field strength only at high field strengths respectively, which cannot be brought into line with Voigt's assumptions concerning the effective field of magnetic anisotropy H_e and the real component of the complex permeability of rotational processes. The H_e-values are calculated according to formulas from Refs. 2 and 3 and compared; best agreement is obtained with a constant perpendicular field of 600 oe (saturation). A theoretical estimation of H_e at H=0 may be attained by means of the formula $H_e = \left[H_i(H_i+\Delta H_e)\right]^{1/2} \approx \left[H_i(H_i+4\pi I_s)\right]^{1/2}$, where I_s is the saturation magnetization, H_i - the effective anisotropy field of a ferrite with destroyed domain structure. For lithium ferrite one obtains with H_i =450 oe, H_e = 1250 oe, which is quite near to the experimental

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FOMENKO, L.A.

Magnetic spectra of nickel-zinc ferrites at various temperatures. Fiz. met.i metalloved. 11 no.6:825-833 Je '61. (MIRA 14:6)
(Ferrates--Spectra)

BOTNIKOV, Ya.A.; KAMINER, B.B.; FOMENKO, L.A.

Obtaining products for the petrochemical industry by the thermal contact cracking of oil residues in a fluidized bed; high-temperature thermal contact cracking. Trudy VNII NP no. 9: 5-14 '63. (MIRA 17:6)

S/181/63/005/003/026/046
B102/B180

AUTHORS: Fomenko, L. A., Shchelkotunov, V. A., and Sochivko, V. L.

TITLE: Thermal conductivity of nickel-zinc ferrites in the temperature range 20-400°C

PERIODICAL: Fizika tverdogo tela, v. 5, no. 3, 1963, 874-882

TEXT: The heat conduction coefficient λ of nickel-zinc ferrites of almost stoichiometric composition was measured in dependence on temperature, composition and sintering temperature t_s. The compositions investigated were $Ni_xZn_{1-x}Fe_2O_4$ with x = 0, 0.1, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9 and 1.0. The specimens, discs ~1.5 cm in diameter and ~0.4 cm high, were sintered at t_s = 1100, 1150, 1200, 1250, 1300 and 1350°C. At room temperature λ was 0.006-0.009 cal/cm.sec.deg and it was found to decrease slowly and almost linearly for those compositions whose Curie points were beyond the temperature range measured (x = 0, 0.1, 0.2, 0.8, 0.9, 1.0); the other compositions had distinct maxima at the Curie point, caused by a sudden increase of about ten percent in the specific heat.

Thermal conductivity of nickel-zinc...

The effects of the components of the heat conduction coefficient ($\lambda = \lambda_1+\lambda_2+\lambda_3+\lambda_4$) are studied in detail. λ_1, the lattice component (phonon scattering), made the main contribution, the contributions of the other components (λ_2 - spin-wave scattering; λ_3 - electron diffusion, λ_4 - heat radiation) depend largely on temperature and composition. E. g., for x=0.3 (t_s=1300°C), Curie point 348°K, λ_2 is great. λ plotted as a function of x for T = 348, 453, 543, 613°K generally shows two maxima: one connected with the Curie point, which shifts to higher temperatures with rising θ_c (x), the other remaining at x=0.3 for all temperatures. At T=438°K both maxima coincide at x=0.3. The $\lambda(t_s)$-curves for all compositions have a maximum around t_s=1200°C. This is attributed to the fact that all ferrites have maximum homogeneity when sintered at 1200-1250°C. The results are in qualitatively good agreement with theory. The weak drop in λ with rising T (i. e. specific heat) is attributed to increase in phonon-phonon scattering, the increase in λ with x to reduced phonon scattering from imperfections (paramagnetic Zn ions)

and reduced anharmonicity of the thermal vibrations caused by an increase in exchange interaction. There are 4 figures and 1 table.

SUBMITTED: August 24, 1962

BR

ACCESSION NR: AP4013486 S/0181/64/006/002/0337/0350

AUTHOR: Fomenko, L. A.

TITLE: Natural ferromagnetic resonance in ferrites

SOURCE: Fizika tverdogo tela, v. 6, no. 2, 1964, 337-350

TOPIC TAGS: ferromagnetic resonance, ferrite, domain structure, dispersion spectrum, damping parameter, magnetization

ABSTRACT: The author has found expressions to describe a semiphenomenological theory of natural ferromagnetic resonance involving strong damping and a consideration of the dynamics of domain-boundary displacement. This work is based on the fundamental equation of motion in which a dissipative member is included, proportional to the rate of magnetization change with time. Expressions are obtained for the parameters of the internal effective field and for damping in ferrites that exhibit natural ferromagnetic resonance. When double-dispersion spectra are clearly separate, the effect of the dynamics of domain-boundary displacement and of natural ferromagnetic resonance is small, and it is possible

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